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RD&D PERMIT MEETING

July 18, 1991

START

Purpose of Meeting

- Propose an Outline
- Discuss Content of Each Section
- Establish Level of Detail

Proposed Outline

- Introduction
  - Purpose
  - Why it is Innovative
  - Objectives

- Demonstration Plan
  - Testing Approach
  - Protection of Human Health and Environment
  - Quality Assurance Program
  - C-018H Example

- Waste Characteristics
  - Waste Types
  - Waste Analysis Data
  - Waste Analysis Plan

- Facility Description/Process Information
  - Location
  - Description
  - Controls

Proposed Outline (con't)

- Controls to Prevent Hazards
  - Design
  - Waste Analysis
  - Procedures

- Contingency Plan
  - Westinghouse Hanford Emergency Plan

- Training Plan
  - Description of Training Program

- Closure Plan
  - Partial Closure
  - Clean Closure

Proposed Content of the Pilot Plant RD&D Permit Application

Introduction

- Flexible Facility with a Broad Range of Uses
  - Groundwater Remediation
  - Treatment of Effluents from 200 and 300 Area Facilities
- Initial Focus 242-A Evaporator/PUREX Treatment Facility (Project C-018H)
- Innovative Demonstration
  - Mixed Wastes
  - Types of Contamination (radionuclides)
  - Range of Contamination

Introduction (con't)

- Purpose of the Pilot Plant

  - Demonstrate
    - Performance Capability
    - Operation/Design Parameters

  - Tailor Existing Technologies
    - Commercially Available Equipment
    - Site Specific Design Needs and Operating Parameters
    - Combined in Non-Standard Configurations

  - Optimize Technologies
    - Improve DFs
    - Reduce Secondary Wastes

  - Provide Regulatory Permitting Support
    - Delisting Petition
    - WAC 173-216 Permit
    - Clean Air Act Permitting

Demonstration Plan

- Testing Approach
- Protection of Human Health and Environment
- Quality Assurance Program
- Example

Demonstration Plan - Testing Approach

- Demonstrate Treatment Technologies on Categories of Contaminants
  - Particulates
  - Organics
  - Dissolved Solids
  - Radionuclides
  - Secondary Waste

Add: Inorganics to the Waste Analysis & Treatment Technologies

- Synthetic Testing to Proceed Actual Waste Testing

- Facility Locations
  - Synthetic Waste Testing
    - Chemical Engineering Laboratory 2703/200 East
    - Plutonium Process Support Laboratory 234-5Z/200 West

? Spiking of Condensate.

  - Actual Waste Testing
    - Engineering and Environmental Demonstration Laboratory 1706-KE/100 K
    - Liquid Effluent Retention Facilities (LERF) 200 East
      (limited filtration testing for C-018H project)
      Concern over particulate in LERF Basin: for particulate removal.
- Capacity of Pilot Plant Equipment
  - Smallest equipment necessary to provide required scale-up data
  - Sized for up to 5 gallons per minute through-put

-Reverse Osmosis Unit
- UV Unit

- Documentation
  - Program Plans
  - Quality Assurance Plan
  - Test Plans
  - Test Reports

Demonstration Plan - Protection of Human Health and Environment

- Readiness Review (WHC-CM-1-3)
  - Facility Specific
  - Prior to Start-up

- Readiness Review Items (Checklist)
  - Emergency Preparedness
  - Environmental Protection
  - Fire Protection
  - Radiation Protection
  - Industrial Hygiene
  - Occupational Safety
  - Nuclear Safety
  - Transportation Safety
  - Weather Procedures
  - Managerial Controls
  - Training, Testing, and Qualifications for Personnel

Demonstration Plan - Quality Assurance Program

- Based on QAMS-005
  - Project Description
  - Project Organization and Responsibilities
  - Quality Assurance Objectives
  - Sampling Procedures
  - Sample Custody
  - Calibration Procedures
  - Analytical Procedures
  - Data Reduction, Validation, and Reporting
  - Internal Quality Control
  - Performance and System Audits
  - Preventive Maintenance
  - Data Assessment Procedures
  - Corrective Action
  - Quality Assurance Reports
  - References

Demonstration Plan - Example

- C-018H Treatment Technologies
  - Particulates - Filtration
  - Organics - Ultraviolet Light Mediated Oxidation, GAC
  - Dissolved Solids - Reverse Osmosis, Ion Exchange add Inorganics :
  - Radionuclides - Reverse Osmosis, Ion Exchange
  - Secondary Waste - Evaporation

- Documentation
  - Treatability Test Program Plan for Project C-018H (WHC-SD-C018H-PPT-001 Rev. 0)
  - Test Plan for Selecting Ion Exchange/Adsorption Media for Use in the C-018H Effluent Treatment Facility (WHC-SD-C018H-TP-002 Rev. 0)
  - Results of Bench-Scale Reverse Osmosis Membrane Selection Test and Tests to Determine pH and Pressure Effects on Ammonia Removal (WHC-SD-CP-TRP-050 Rev. 0)
  - In Process:
    - Removal of Inorganic Compounds from Various Simulated Project C-018H Feeds using Reverse Osmosis
    - Destruction of Organic Compounds in Various Simulated Project C-018H Feeds using Ultraviolet Light Mediated Oxidation

Waste Characteristics

- Types of Wastes
  - Facility Effluents (242-A, UO_3, B-Plant, PUREX, etc.)
  - Contaminated Groundwater
- Waste Analysis Data
  - Summary Data for Hanford Liquid Effluents
  - Dangerous Waste (F003, F005, WT02)

} Establish Envelope. physical characteristics of waste i.e. safety flow pH in treatment vessel ? explosive / reactive waste.

- Waste Analysis Plan
  - Dangerous wastes will be characterized by a Generator Waste Analysis Plan
- Pilot Plan will not receive ignitably reactive or incompatible waste
  - will receive corrosive streams
  - ? UO_3 corrosive stream : process condensate to be neutralized at UO_3 plant.

Facility Description and Process Information

- o Introduction
  - Simulant Testing performed at 2703-E/PFP
  - Actual "Hot" Testing at 1706-KE
  - Filtration Testing performed at LERF
  - Tanker trucks to transport wastewater from generator to 1706-KE (e.g., LERF)
    10,000 gal double lined tanker trucks.
- o Location of Sites at Hanford
  - Site Maps
- o Facility Descriptions
  - 1706-KE
    - Past Uses
    - Floor Plan
    - Maximum Flexibility for Flowsheet Changes
    - Tanker Loading/Unloading
    - Ventilation System (HEPA, possibly charcoal)
    - Analytical Capabilities
    - Tank Design
  - LERF
    - Onsite Filtration
    - Tanker Loading/Unloading
    - Area Plan

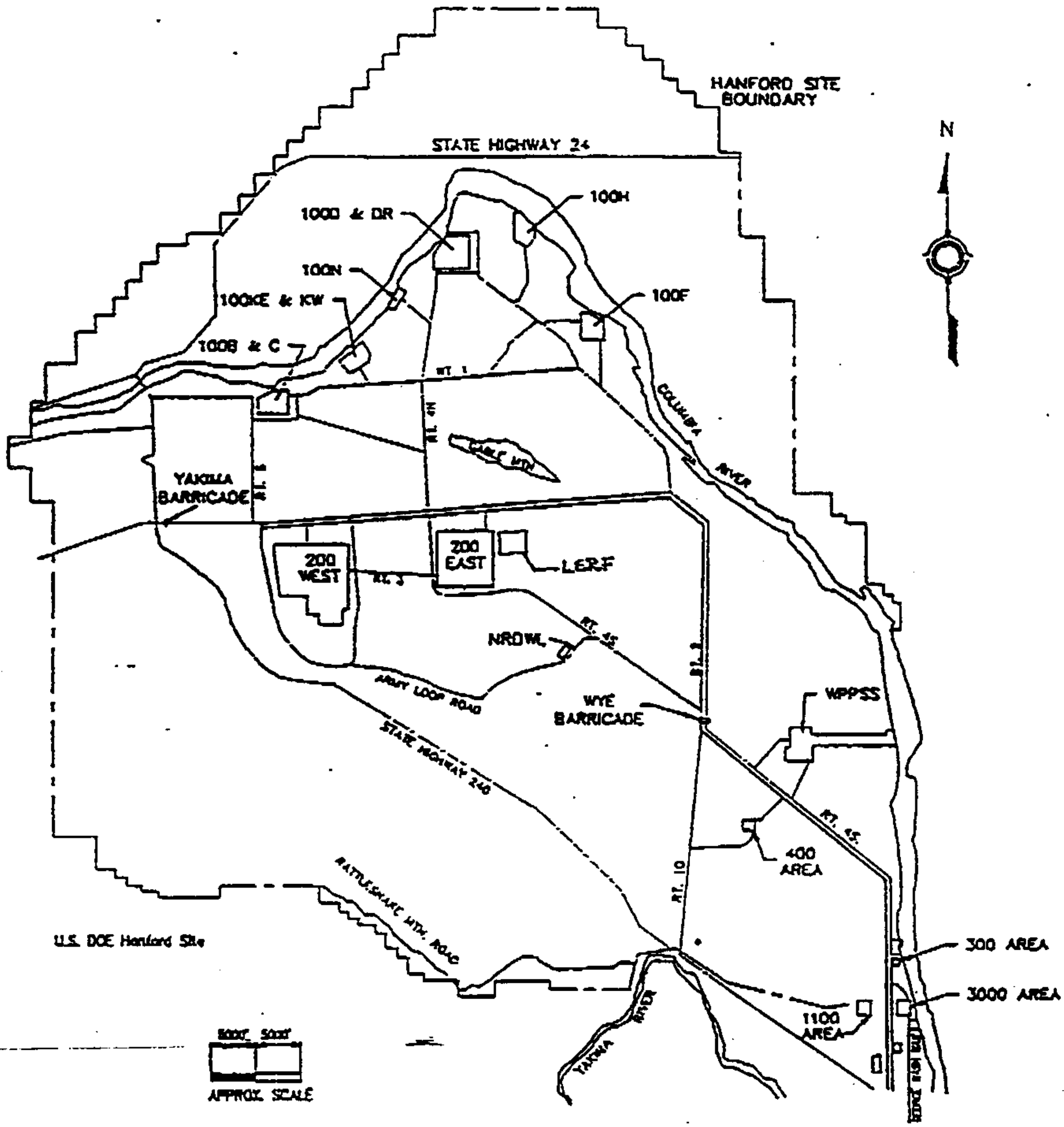
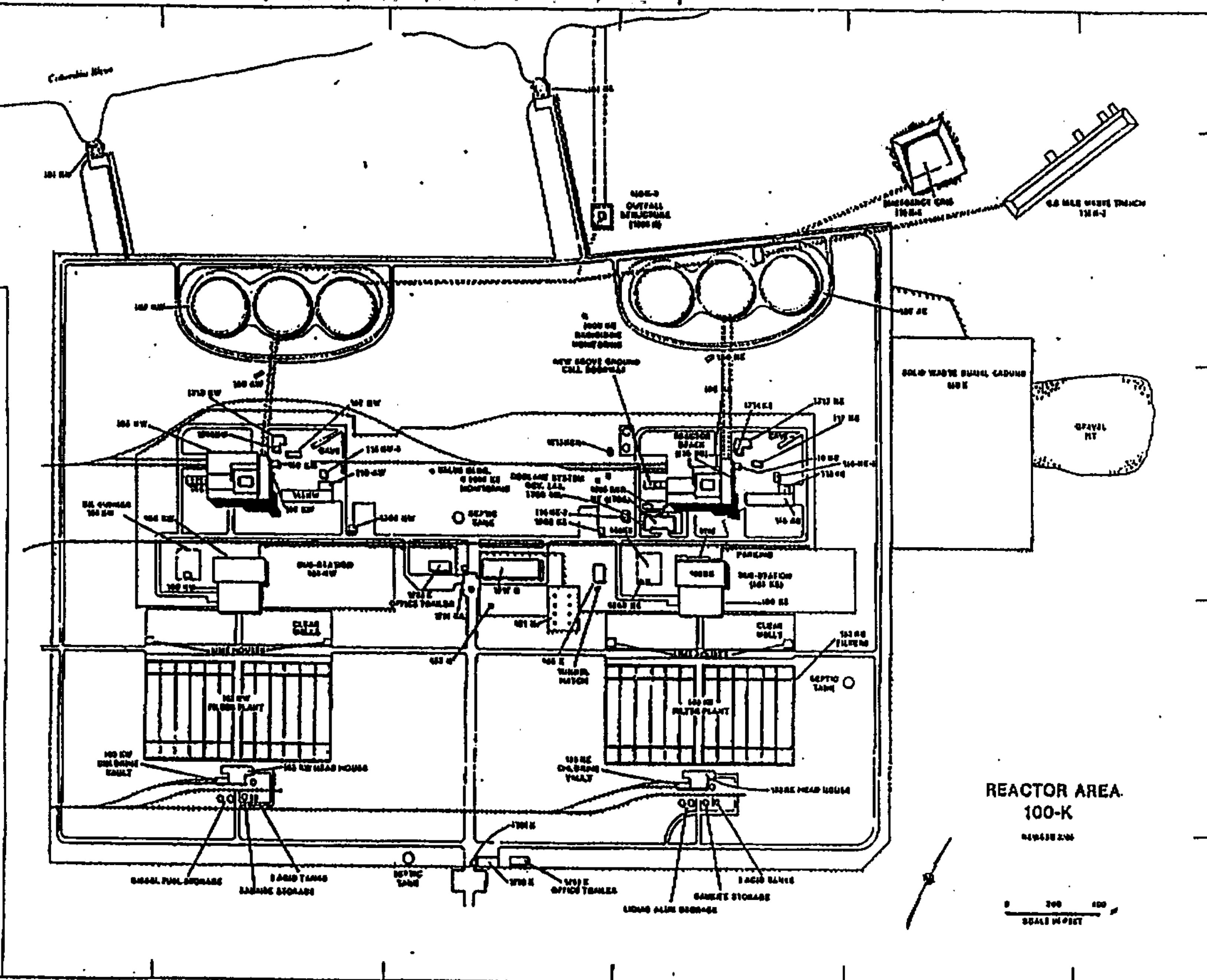


Figure 1. Hanford Site, Richland, Washington

9 [illegible] 1 2 9 [illegible] 1 9 2 1

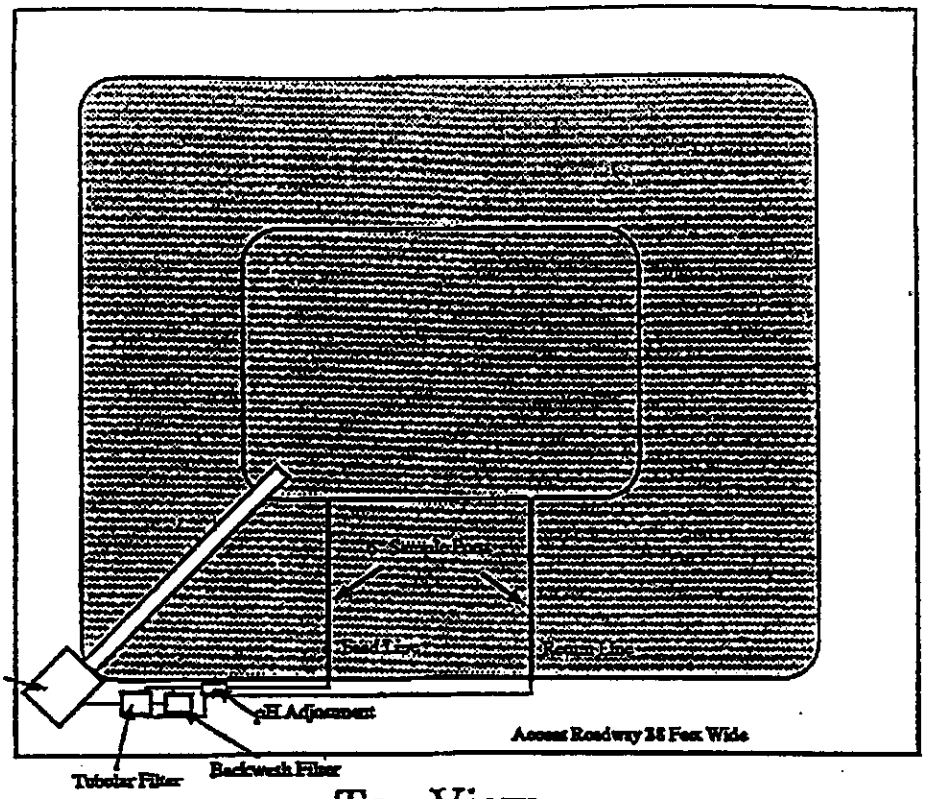


BUILDING LIST

BUILDING NUMBER	DESCRIPTION
105 KW	REACTOR BUILDING
107 KW	WATER RETENTION BASIN
[illegible] KW	GAS STORAGE
[illegible] KW	GAS RECIRCULATION BUILDING
116 KW	REACTOR STACK
117 KW	EXHAUST AIR FILTER BUILDING
[illegible] KW	EXHAUST AIR SAMPLE BUILDING
[illegible] KW	HEAT RECOVERY FACILITY
[illegible] K	SWITCHING STATION
[illegible] KW	SUBSTATION [illegible]
165 KW	POWER CONTROL BUILDING
166 KW	OIL BUNKER
167 K	CROSS TIE TUNNEL BUILDING
181 KW	RIVER PUMP STATION
182 K	EMERGENCY WATER PUMP HOUSE
183 KW	FILTER PLANT
[illegible] KW	CHLORINE VAULT
[illegible] KW	HEAD HOUSE
190 KW	MAIN PUMP HOUSE
1701 K	BADGE HOUSE
1701 KE	EXCLUSION AREA BADGE HOUSE
[illegible] KW	BADGE HOUSE
1713 KW	WAREHOUSE
[illegible] KW	OIL STORAGE
1717 K	MAINTENANCE & TRANSPORTATION
1720 K	OFFICES & TELEPHONE EXCHANGE
[illegible] K	OFFICE TRAILER
[illegible] K	OFFICE TRAILER
105 KE	REACTOR FACILITY
107 KE	WATER RETENTION BASIN
[illegible] KE	GAS STORAGE
[illegible] KE	GAS RECIRCULATION BUILDING
[illegible] KE	REACTOR STACK
117 KE	EXHAUST AIR FILTER BUILDING
[illegible] KE	MAINTENANCE SHOP
[illegible] KE	HEAT RECOVERY FACILITY
165 KE	POWER CONTROL BUILDING
[illegible] KE	OIL HOUSE
[illegible] KE	OIL BUNKER
181 KE	RIVER PUMP STATION
[illegible] KE	CHLORINE VAULT
[illegible] KE	HEAD HOUSE
[illegible] KE	BADGE HOUSE
1706	EFFLUENT WATER TREATMENT PILOT PLANT
1706 KE	WATER STUDIES SEMIWORKS FACILITY
1706 KER	WATER STUDIES RECIRCULATION BUILDING
1713 KE	SHOP BUILDING
1713 KER	WAREHOUSE
1714 KE	OIL & PAINT STORAGE

RADIOLOGICAL UNDERGROUND SITES (ACTIVE)

BUILDING NUMBER	DESCRIPTION
118 K	SOLID WASTE BURIAL GROUNDS
[illegible]	EMERGENCY CRIB
[illegible]	[illegible] MILE WASTE TRENCH
107 KE	RETENTION BASIN TANKS
107 KW	RETENTION BASIN TANKS
[illegible]	[illegible] KE CRIB
[illegible]	[illegible] KW CRIB
[illegible]	[illegible] CRIB
[illegible]	[illegible] OUTFALL



Top View

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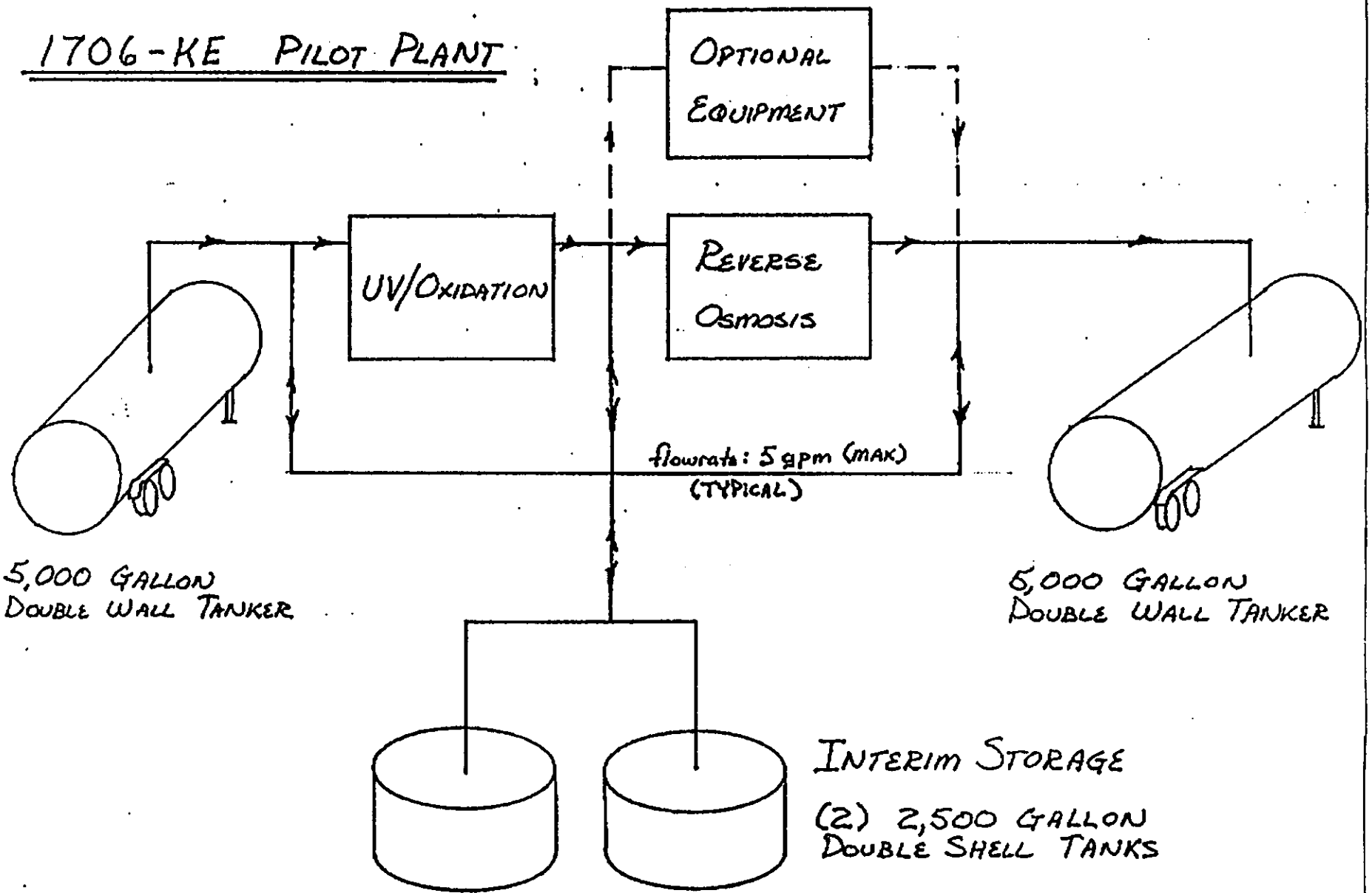
Elevation

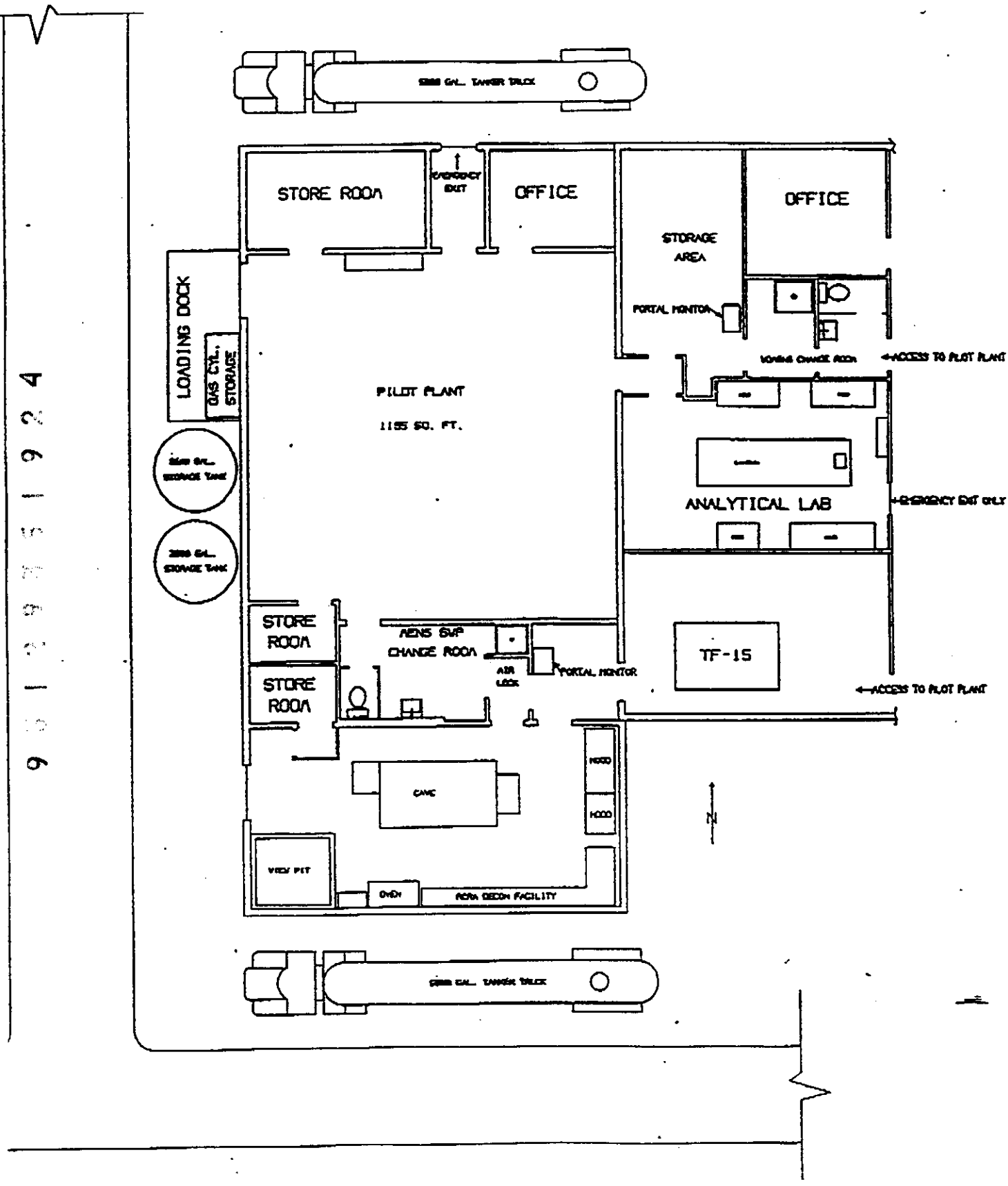
Liquid Effluent Retention Facility Basin Layout

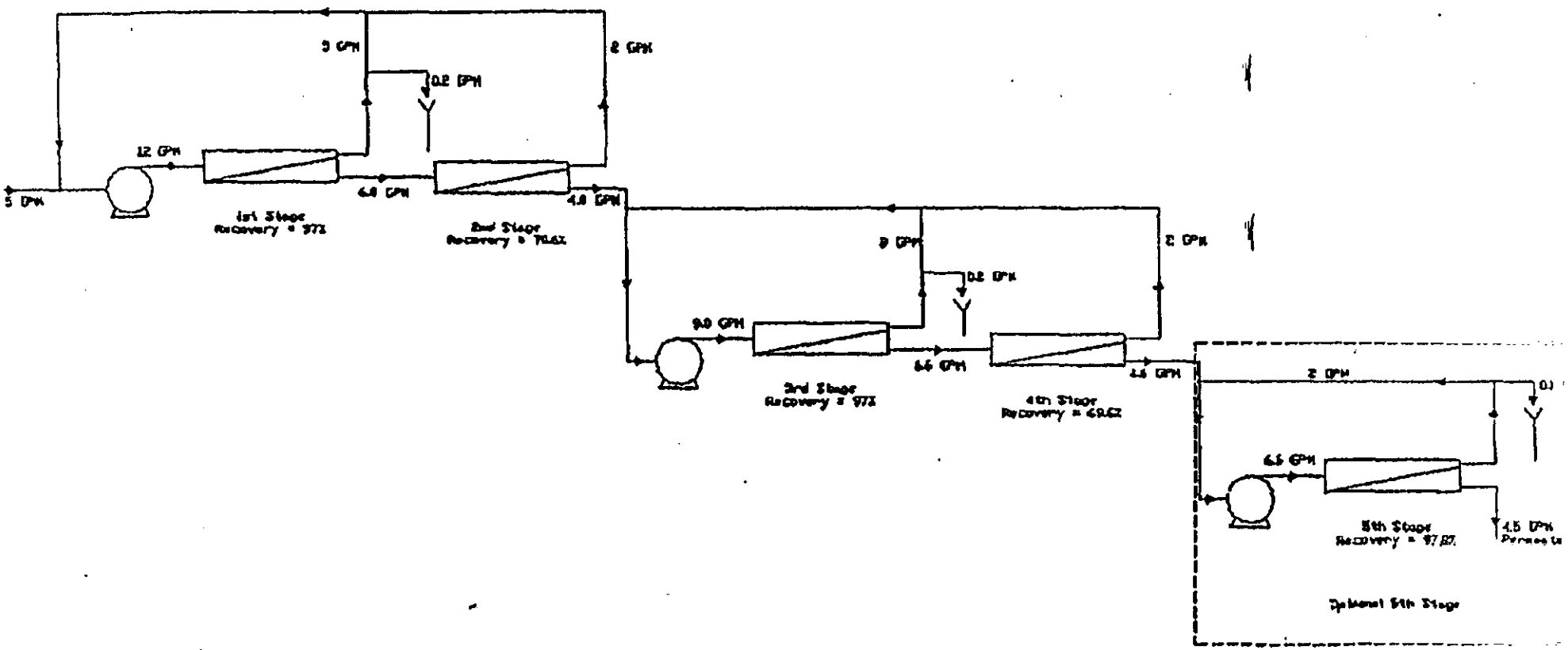
Figure 1

1706-KE PILOT PLANT



1706-KE PROPOSED PILOT PLANT



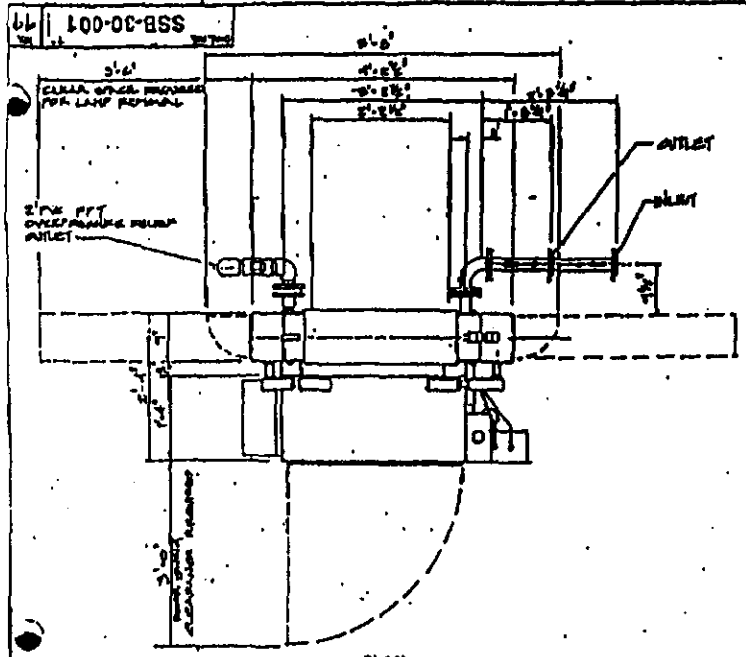


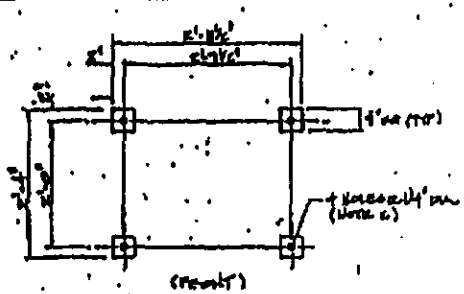
Pilot Plant System

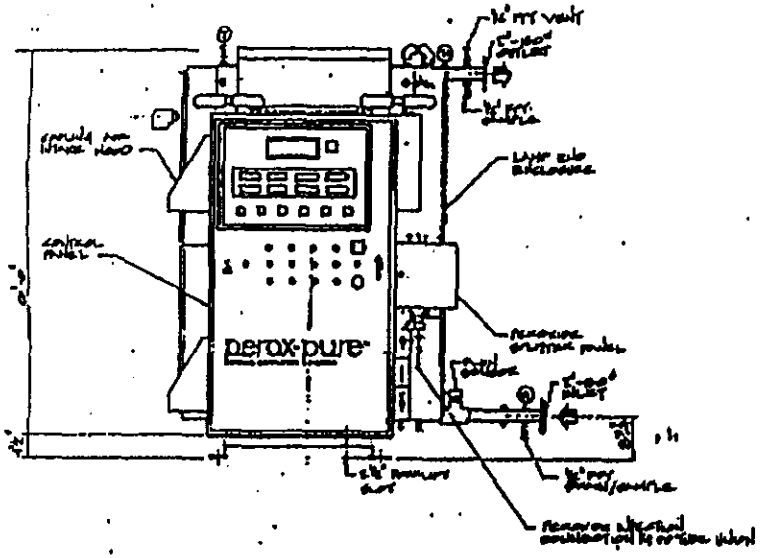
Flows Chart

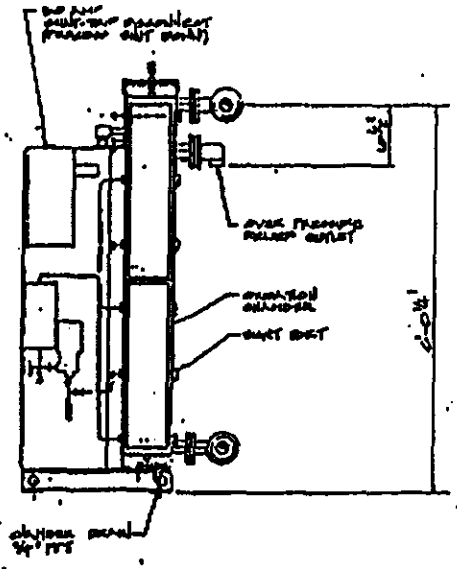
Applied Membranes,

P-1101 Rev. 5/21/









Peroxidation Systems, Inc.

perox-pure™ MODEL SSB-31
ARRANGEMENT

SSB-30-001

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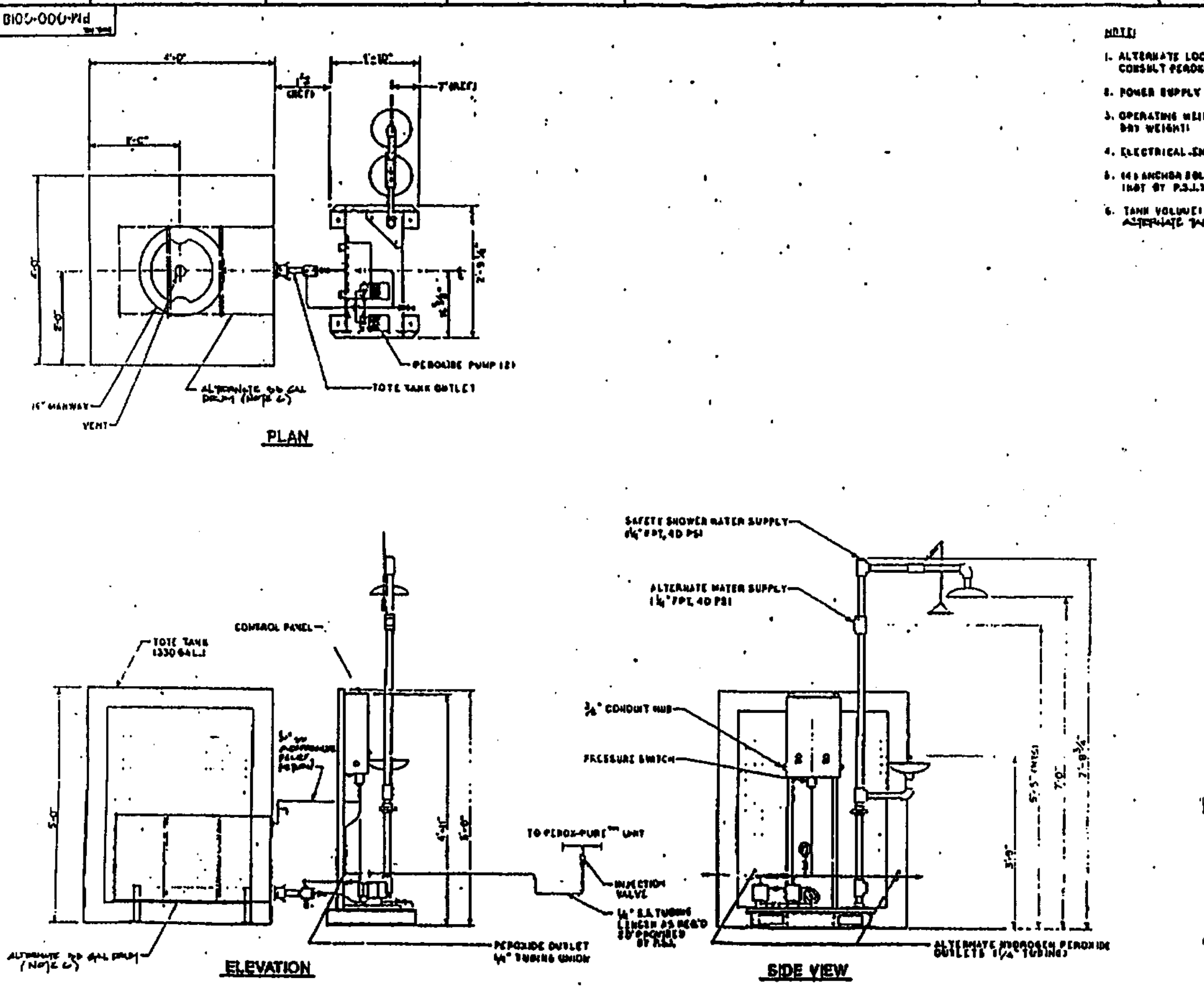

NOTE:

1. ALTERNATE LOCATIONS FOR SAFETY SHOWER ARE AVAILABLE: CONSULT PEROXIDATION SYSTEMS, INC.
2. POWER SUPPLY 1/60/115 (FROM PEROX-PURE MODULE)
3. OPERATING WEIGHT: 4000 LBS
   DRY WEIGHT: 1000 LBS
4. ELECTRICAL ENCLOSURE: NEMA 4
5. (4) ANCHOR BOLTS 5/8" MIN 2 1/2" PROJECTION REQUIRED (NOT BY P.S.I.)
6. TANK VOLUME: 330 GALLONS
   ALTERNATE TANK VOLUME = 55 GAL } REFER TO PSI PROPOSAL

ADDED DRUM ALTERNATE

Peroxidation Systems, Inc.

PEROXIDE MODULE PM-000
ARRANGEMENT

PM-000-0018

Facility Description and Process Information (con't)

- Process Equipment Descriptions
  - Flow Diagram
  - Physical Description
  - Equipment Drawings
  - Maximum Flowrate
  - Equipment Hold-up

- Containment Controls
  - WAC 173-303 Requirements
  - Double-Walled Tanks
  - Welded Pipe where possible
  - Catch Pans
  - Pressure Testing
  - Pump Interlocks

Controls to Prevent Hazards

- Summary of Design and Administrative Controls

- Facility Design
  - Double-Walled Tanks
  - Welded Pipe where possible
  - Catch Pans
  - Pressure Tests
  - Pump Interlocks
  - Ventilation System (HEPA, possibly charcoal) - Design Information tied to Operating Envelope.
    - changing HEPA's filling charcoal.

- Waste Analysis
  - Pilot Plant will only receive hazardous wastes which are characterized by a Generator Waste Analysis Plan

- Administrative Controls
  - Readiness Review
  - ALARA - Radiation Work Permit
  - Job Safety Analyses
  - Laboratory Test Controls (e.g., Job Safety Analysis, Test Plans)
  - QA Project Plan

Contingency Plan

- The Contingency Plan requirements will be satisfied by referencing the following document
  - Westinghouse Hanford Emergency Plan (WHC-CM-4-1, 1989)

- The Building Specific Emergency Plan will have the sections and information described as follows:
  - Introduction--general facility information including, facility name, location, owner, description of the operation, and identification of evacuation routes
  - Purpose--plan purpose and employee requirements
  - Potential Emergency Conditions--an identification of the potential types of emergencies that the plan addresses
  - Emergency Resources--a discussion of the emergency organization, emergency equipment description, emergency notification procedures, and activation of alarms
  - Emergency Response Plans--plans for assessing and responding to emergencies including evacuation, natural emergency responses, hazardous materials response, and radioactive materials and mixed waste incident responses
  - Termination of Emergency--method of assuring that the emergency is terminated and the facility cleaned and ready for use
  - Accident Recovery--methods of recovering from accidents
  - Post Accident Analysis and Reporting Requirements
  - Amendments to the Emergency Plan

Training Plan

- The Training Plan will provide the following information:

  - Job titles and description of the duties of personnel that will work at the RD&D facility
  - A description of the training course content, frequency, and techniques--the plan will demonstrate that personnel are trained in accordance with OSHA requirements (training on contingency plan).
  - An identification of the training director
  - A discussion of how the training program is implemented
  - Summaries of the training courses

Closure Plan

- The closure plan will describe the plans for clean closing the RD&D facility at the end of the test period. Some partial closure activities may be performed in instances where a piece of equipment will not be used for an extended time period.

- The following information will be provided:

  - A discussion of the closure performance standard as it applies to the RD&D facility
  - A description of planned partial closure activities
  - A discussion of equipment and structure decontamination
  - A description of the decontamination verification (sampling) procedures
  - A discussion of how individual items such as tanks or containers will be closed
  - A discussion of closure notification requirements
  - A list of closure contact personnel

Reporting and Recordkeeping

- The reporting and recordkeeping section will summarize commitments for reports and records maintenance
- Summaries of reports and records requirements for generators, transporters, and the RD&D facility operations